


CODE IDENT NO. 25500

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Progress Letter for Period

1 July - 1 August 1964

MODULATED-LIGHT FILM VIEWER SYSTEM

4 August 1964



DECLASS REVIEW by NIMA/DOD

218-52 (6-63)
REF: ENGINEERING PROCEDURE 2017

1. Progress of Work to End of Period

The objective of this program is to determine the feasibility of a Modulated-Light Film Viewer that will provide a variable back-light intensity according to the density and spatial frequency of the image being backlighted. Effort during this reporting period consisted of conceptual studies in the area of detection of the information content of a photographic image and back-lighting techniques.

One scheme being investigated involves a CRT used as a flying spot scanner to generate video which is processed to generate the necessary modulation function. A breadboard was assembled to evaluate this technique that consists of a CRT that is used to scan for information sampling and backlighting, a lens to image the CRT display on an aerial photograph, and a half-silvered mirror to reflect a portion of the light to a photomultiplier. This breadboard is being used to investigate the effects of various mirrors, screen materials, and optical geometries along with the latitude of video detection and modulation.

A second detection technique utilizes optical spatial filtering and a TV sensor. This technique can be implemented by an off-axis schlieren optical system and imaging the high-pass filter scene on a vidicon which, in turn, is used to generate the modulation signal for the backlight CRT. The effect of such a

system was simulated on a breadboard setup. Although the technique in its final form can be implemented without a duplicate film, the breadboard setup utilized duplicate positives for sake of simplicity. The setup consists of a schlieren optical system that projects a high-pass filtered image on the original image. The results of this breadboard are encouraging and warrant further investigation.

The possibility of using the CRT directly as a light table was investigated. It was found that the thickness of the CRT faceplate causes a severe parallax problem, and therefore the scheme does not appear feasible.

2. Problem Areas Encountered

A major problem in the development of a Modulated-Light Film Viewer is the distortion between the scanning system for detection and the system for backlighting. A second problem is the requirement for high resolution for the detection of high spatial frequencies. Another problem is the semispecular condition of the projected illumination. The light used for the detection of high spatial frequencies that is projected on the film must be specular in order to achieve high resolution. On the other hand, optimum viewing requires a diffused backlight; therefore, a compromise may be required.

3. Projected Work for Next Period

Work will continue in the investigation of simultaneous detection

and backlighting utilizing a CRT for the generation of video and as a backlight. A high intensity CRT will be ordered. In addition, high intensity direct view storage tubes will be investigated in an effort to replace the CRT. The optical spatial filtering technique described above will be investigated further.

The selective filter-mirror will be procured and evaluated. The effect of diffusing material to eliminate the semispecular condition of the projected illumination will be investigated. STATINTL

5. Confirmation of Verbal Agreements

No verbal agreements were made during this period.

77.10 (5-63)
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